



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 921 302 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.09.2000 Bulletin 2000/36

(51) Int. Cl.⁷: **F02M 47/02**

(43) Date of publication A2:
09.06.1999 Bulletin 1999/23

(21) Application number: **98309515.9**

(22) Date of filing: **20.11.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Cooke, Michael Peter
Gillingham, Kent ME7 1DR (GB)**

(30) Priority: **06.12.1997 GB 9725802**

(74) Representative:
**Bailey, Richard Alan et al
Marks & Clerk,
Alpha Tower,
Suffolk Street Queensway
Birmingham B1 1TT (GB)**

(71) Applicant:
**Lucas Industries Limited
London W1Y 4DJ (GB)**

(54) **Fuel injector**

(57) A fuel injector comprises a valve needle (14) engageable with a seating to control fuel flow from a delivery passage (18) to an outlet opening (20), a control chamber (24) communicating with the delivery passage (18), the control chamber (24) being defined, in part, by a surface associated with the valve needle (14) orientated such that the application of fuel under pressure to the control chamber (24) applies a force to the valve needle (14) urging the valve needle (14) towards its seating, a control valve (62) controlling the fuel pressure within the control chamber (24), and a delivery valve (40, 46) responsive to the fuel pressure within the control chamber (24) to control the flow of fuel along the delivery passage (18) towards the seating.

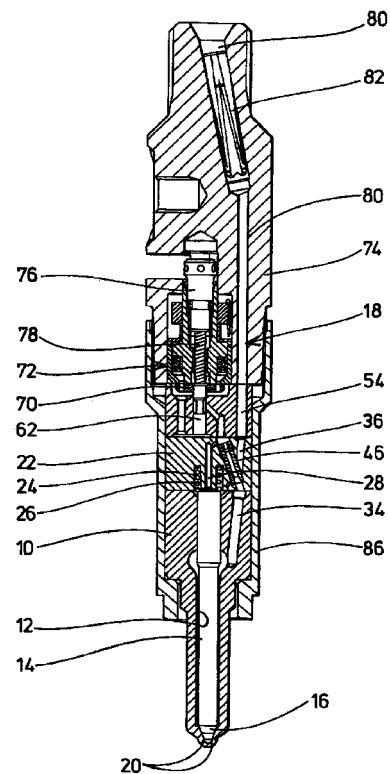


FIG 1

EP 0 921 302 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 9515

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE 27 59 255 A (BOSCH GMBH ROBERT) 12 July 1979 (1979-07-12) * page 11, line 28 - page 13, line 14; figures 1,2 * ---	1	F02M47/02
E	DE 197 42 320 A (BOSCH GMBH ROBERT) 1 April 1999 (1999-04-01) * column 7, line 49 - column 8, line 40; figure 7 * ---	1	
A	US 5 263 645 A (PAUL MARIUS A ET AL) 23 November 1993 (1993-11-23) * column 4, line 52 - column 5, line 46; figures 1,2 * ---	1	
A	EP 0 753 660 A (ISUZU MOTORS LTD) 15 January 1997 (1997-01-15) * abstract; figures * -----	2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F02M
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 July 2000	Examiner Torle, E
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 30 9515

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-07-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2759255 A	12-07-1979	NONE	
DE 19742320 A	01-04-1999	WO 9915778 A EP 0939857 A	01-04-1999 08-09-1999
US 5263645 A	23-11-1993	US 5397055 A US 5299919 A	14-03-1995 05-04-1994
EP 0753660 A	15-01-1997	JP 9032680 A DE 69605155 D DE 69605155 T US 5722600 A	04-02-1997 23-12-1999 04-05-2000 03-03-1998